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PROGRAM MANAGEMENT COURSE
INDIVIDUAL STUDY PROGRAM

USER: TOTAL SYSTEM MANAGEMENT

STUDY PROJECT REPORT
PMC 77-1

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USER: TOTAL SYSTEM MANAGEMENT

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by

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May 1977

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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE:

USER: TOTAL SYSTEM MANAGEMENT

STUDY PROJECT GOALS:

Disseminate the roles and missions of a new player in the materiel acquisition process; the TRADOC System Manager.

STUDY REPORT ABSTRACT:

This report describes the responsibilities of a newly designated individual within the user community. After presenting the relationships in existence since Army reorganization in 1973, the rationale for establishing a system manager by the user representative is described. Details of the TRADOC System Manager responsibilities and those systems which will receive this type treatment are presented.

Observations on the implementation of total system management by the user representative community ask for support but also caution against misperceptions of the role of this new player in the system acquisition process.

KEY WORDS: TRADOC System Manager; Total System Manager; Combat Developments.

NAME, RANK, SERVICE	CLASS	DATE
Francis R. Scharpf, Maj, USA	PMC 77-1	11 May 1977

EXECUTIVE SUMMARY

The purpose of this report is to disseminate the roles and missions of the TRADOC System Manager to the materiel development community. The combat developer, as user representative, has formalized and chartered a counterpart to the materiel developer's project manager. A review of combat developments activities within TRADOC is made to illustrate the complexity of integrating user responsibilities in the materiel acquisition process. The rationale and expected payoffs are then discussed.

The responsibilities assigned to the TRADOC System Manager are presented as well as the existing programs to which this management concept will be applied.

Finally, the author provides his observations on the potential impacts of a single manager for user inputs to the materiel acquisition process. The author recommends support for the concept but warns that the key to initial success hinges upon the perceptions of the TRADOC System Manager concept by the individual TSM and his counterpart, the project manager.

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INTRODUCTION

Purpose of the Study Project

Distribution of "Operating Policies for Systems Acquisition by the Department of the Army" (Ref B) in January 1977 formalizes, at Department of Defense component level, the Training and Doctrine Command (TRADOC) System Manager (TSM) concept.

The Army's actual users are those major commands with assigned operational forces. The user's role in materiel acquisition is performed by a representative called the combat developer. Authority for fulfilling the combat developments mission has been assigned to Commander, Training and Doctrine Command.

The TSM is real and being implemented. The user representative has formalized his role and chartered a counterpart to the materiel developer's project manager.

The acquisition community should be made aware of this significant effort as the TSM will actively participate in system management at all levels requiring user input.

Since no one likes "surprises" in materiel acquisition, forewarned is forearmed. This report will assist in disseminating the roles and missions of the TRADOC System Manager so that all interested agencies can understand the

motivation and purpose of such a commitment of management resources by the user community in the Army.

SECTION II

Beginnings

Reorganization experienced by the Department of Army in 1973 has heavily impacted upon the materiel acquisition process. Dissolution of Combat Developments Command (CDC) and Continental Army Command (CONARC) implemented significant changes in user-developer relationships. No longer does there exist a separation of concepts, doctrine, training, logistics, and personnel responsibilities within the user community. The residuals of Combat Development Command physically moved to Fort Monroe, Virginia in July 1973 and became a major staff section within the newly formed Training and Doctrine Command (TRADOC). The Deputy Chief of Staff for Combat Developments (DCSCD) was charged to execute combat development responsibilities in the materiel acquisition process, and to be concerned with near to mid-range materiel requirements and force structure. This executve responsibility has remained unchanged.

Organizational elements within TRADOC having combat development responsibilities include integrating centers (Combined Arms Combat Development Activity, Ft. Leavenworth; Logistics Center, Ft. Lee; Administration Center, Ft. Benjamin Harrison) and a portion of each service school. Test Boards located at the service schools are also directly responsible to the combat developments community.

Commandants of each service school, assisted by staff and faculty represent the resident expertise in respective functional areas, since at the school the basic instruction in functionally peculiar operator and maintenance skills are introduced, improved and refined. Training which provides advanced skills for officers and enlisted soldiers is also conducted and provides a forum for innovation and deficiency identification in both hardware and operational concepts. The concentration of expertise at several locations permits continual sharpening of specialized skills but at the same time, does contribute to integration difficulties.

Just as system engineers must integrate and accommodate hardware subsystems, so must the user integrate all aspects of a total system from the user viewpoint (operation, doctrine, organization, hardware, software, logistics, training, and personnel). After all, during the total life cycle of a system the user will expend more resources (time and money) on the total system than the materiel developer has in development and production. It therefore behooves the user to be intimately involved at the earliest stages in hardware development to influence the ultimate product.

Accommodating both an organizational philosophy enhancing functional expertise but hampered by geography, and user responsibilities requiring integrated knowledge in numerous functional areas has been difficult, particularly

in the formative years at TRADOC.

Coupling the user's integrating challenge with current efforts to reduce the duration of systems development (Ref B) has created significant pressure, thereby inducing change. Business as usual in an arena of increasing hardware complexity can only result in either program slippage or fielding less than a total system on schedule. Either result is costly and unsatisfactory.

Management Initiatives

System management initiatives within the user community are emerging. Fashioned after the Project Manager approach to cut across functional areas to insure integration, TRADOC is implementing a system manager concept, with twelve systems designated for the initial effort. As resources are identified, the number of systems will increase to approximately thirty.

The TRADOC System Manager (TSM) will be the counterpart to the project manager and will provide user inputs during the materiel acquisition process. The TSM will be responsible, under charter, to orchestrate all facets of user input throughout the development cycle of designated systems. (Ref A)

RATIONALE FOR TOTAL SYSTEMS APPROACH

The current activities in systems development have been, to a large degree, piecemeal. The areas of hardware, doctrine, logistics, personnel, and training have been parallel efforts and not always on the same time schedule. Sometimes the logistics, personnel and training aspects have been deferred due to technical difficulties which consumed more resources than originally estimated. Without integration, the overall system effectiveness has not been optimized. Optimization requires tradeoff capabilities, with those tradeoffs made in an environment conducive to accurate assessments of consequences.

Pressures

In an environment of increasing hardware sophistication, increasing costs and diminishing resources, new methods are mandatory to fill identified force deficiencies and satisfy valid user needs. Increased complexity in weapons systems dictates the development of better training techniques and more efficient logistics. When diminished purchasing power is added to the equation, the results must include both a cheaper way to train and optimized logistics.

Reduced Development Time

Efforts to shorten the development cycle by eliminating DT/OT III and low rate initial production (LRIP) remove the opportunity to refine training and support packages subsequent to full scale development. The time available to design and demonstrate training packages (to include training devices), personnel implications, logistics packages, reliability, availability, maintainability and durability (RAM-D) has been significantly reduced. The sample size (number of systems available) has also been reduced, demanding valid and complete data gathering and analysis plans within the test design. Input data for Cost and Operational Effectiveness Analysis (COEA) and Cost and Training Effectiveness Analysis (CTEA) will require earlier planning and coordination. The necessity for definitive personnel, training and logistics requirements is obvious when a shorter development cycle is the trend. User participation in comprehensive planning, refinement of plans in the validation phase and testing in full scale development is the solution. Areas requiring increased emphasis in planning and preparation for demonstration in DT/OT II will consume more resources at the front end of the development cycle and include:

Integrated Technical Documentation and Training (ITDT)

As maintenance ratios for sophisticated weapons systems increase, the maintenance burden for tactical units increases

as reflected in the number of mechanics required to shoulder that load. A major tradeoff is between extensive training time and effort for mechanics versus technical manuals which reduce or eliminate training time by being more useable by individuals with minimum mechanical aptitude. Technical manuals fashioned after many commercial "do it yourself" books with simple drawings will reduce the necessity and duration of costly resident training as well as reduce errors experienced in the field. Associated with these new manuals are job performance aids to enhance self-learning. These manuals and devices will be required for OT II.

Integrated Training Program. Analysis of possible approaches to training crew members and operators will help to identify the optimum mix among training devices, simulators (full crew interaction, conduct of fire, driver), hands on, programs of instruction, programmed training extension courses (TEC) and training films. Again, optimization is the goal.

Ammunition Supply. Proliferation of weapons systems, specifically antitank missiles and the mounting of more than one weapon on a single carrier will impact on supply functions and organizations. For planning purposes, the expected scenario, anticipated expenditure rates, and the corresponding basic load requirements must be examined in conjunction with existing stockpiles, transportation capability within the force and packaging of the ammunition (cube vs weight). Should the system under development adversely impact the existing

supply system, programs to accommodate the new weapon system must be initiated so that the system can be logistically supportable at initial operational capability (IOC) date.

Personnel. Critical analysis of crew and operator tasks and necessary skill levels will allow early preparation of soldier's manuals and skill qualification tests (SQT). The personnel system can begin to identify new military occupational specialties (MOS), skill identifiers, eliminate MOS no longer needed, etc., with sufficient lead time to permit fielding a total system.

Geography. The sources of expertise in the user community are geographically distributed according to functional responsibilities (Ft. Leavenworth - doctrine, division to corps; Ft. Knox - Armor; Ft. Lee - Logistics; Ft. Benjamin Harrison - Personnel; etc.). Physical separation of necessary expertise strains the timely accomplishment of desired coordination. The TRADOC solution is the System Manager.

Rewards

Early involvement of the user, analysis of alternatives to make the total system package complete, and development of those items necessary to optimize the system will increase front end costs of development. The payoff lies in reducing overall costs in the operation and support (O&S) phase of system life.

TRADOC SYSTEM MANAGER

The user community has a challenge analagous to the project manager. The user community is moving to meet this challenge without the benefit of a formal training ground or mechanism to foster recurring utilization of system acquisition expertise, however acquired. No formal structure like the Project Manager Development Program currently exists within the user environment.

Who

The TRADOC System Manager (TSM) will be a Colonel or Lieutenant Colonel as a counterpart to the Project Manager. TSM selection at the outset is a closely coordinated effort between Department of Army Military Personnel Center (MILPERCEN) and Headquarters TRADOC.

What

The TSM will be chartered by Commander, TRADOC to be a total system integrator, an organizer, an energizer, and the TRADOC single point of contact (POC) for a particular system. TSM office staffing will include training, logistics and personnel expertise. This manager will be responsible, under his charter, to the school commandant and the TRADOC commander to orchestrate all facets of user input and actions throughout the life cycle of the particular system.

Where

The TSM will be physically located at the TRADOC repository of expertise for the particular system, the pro-

ponent school or center.

When

The TSM will be appointed early in the acquisition cycle, preferably concurrent with designation of a project manager. The planned phases and associated schedules for completed staffing are shown in Table 1.

TSM Offices

PHASE I (Jul 77)	PHASE II (Dec 77)	
XM-1	HELLFIRE	ATSS
MICV/TBAT	AN/TTC-39	XM198 & ASSOC SYS
ITV	SMOKE	PLRS
TOS	COPPERHEAD	PERSHING II
TACFIRE	STINGER	SINCGARS
GSRS	SOTAS	TACSATCOM
PATRIOT	RPV	8" HOW SYSTEMS
ROLAND		EM INTEL/EW
ARGADS	FIREFINDER	ABN INTEL/EW
AAH	TO BE ANNOUNCED	
ASH	TABLE 1	

List comes from briefing package prepared at HQ TRADOC, Apr 77. (Ref A)

EXPECTED PAYOFFS

Time

Reduced time to accomplish user contributions to the development cycle. Integrated management across functional areas from the conceptual phase through production, deployment and disposal of the system.

Quality Control

Well defined user requirements which are consistent, doctrinally correct and fully coordinated from a single source will reduce incorrect interpretations.

Reduced Costs

Monies invested in the front end of the development cycle will reap benefits in the deployment phase by reducing operation and support costs.

Assist the Materiel Developer

TSM will provide a single point of contact for the Project Manager to obtain user inputs, as well as user positions in tradeoff considerations throughout the system life cycle. TSM will enhance the satisfaction of the ultimate customer, the field soldier.

Increased Force Effectiveness

TSM contributions and direction will lead to actually fielding total systems. Force capabilities will be enhanced

by introduction of systems designed to allow extraction of maximum operational capability via optimized training and logistic subsystems.

TSM Responsibilities

Coordinate with MACOM	Interface with DARCOM
Interface with Project Manager	Review Contractual Actions
Special Study Group/Special TF Member	Review Tradeoffs
User Input to LCSMM	Represent TRADOC
Defend System Requirements	Ensure Force Integration
Cost and Operational Effectiveness Analysis (COEA)	Prepare TRADOC Position
Participate in Decision Reviews	Schedule and Integrate User Activities
Participate in Testing	

Table 2

Outlined responsibilities come from briefing package prepared at HQ TRADOC, Apr 77. (Ref A)

SECTION III

THOUGHTS

Perspective

I entered the user representative community as a tyro in 1973. A product of on-the-job training at Hq TRADOC for four years, I have been able to observe and participate in the latest stages of user maturity. Currently, I am transitioning between the user community and the materiel development arena via formal education. These circumstances constitute the view from which the subsequent thoughts are rendered.

Approach

The combat developer, as user representative, is pursuing a rational management approach to fulfilling assigned responsibilities. The proliferation of interested agencies in systems development within the user family is commensurate with the materiel developer's challenge. Lack of intensive management in areas requiring focus has resulted in excessive "ad-hocracy". Accomplishing objectives via ad hoc groups is adequate as long as the number of items requiring intense short term attention do not multiply to such an extent that the remaining systems suffer. Intermittent application of special group attention over a long period of time, such as in systems development, leaves no thread of continuity or corporate memory. The institution of a "corporate cell"

called the TSM office will preclude reinventing the wheel each time a system in development requires special attention. Hopefully, this "corporate cell" will be able to do advance planning and either resolve foreseen problems or minimize problems as they occur by acting with full knowledge.

One must remember that this intense management will only be applied to designated systems. The question should arise: "What about the non-selected systems?" By eliminating most of the requirements for task forces, whose only sources of people are permanent organizations (already staffed at "minimum essential"), the non-select systems can be handled through undisturbed established procedures by assigned personnel.

Functional Focus

Placement of TSM offices at the proponent center or school within TRADOC gives the manager ready access to functional expertise at the grass roots level. The separation between the TSM and TRADOC Headquarters can be difficult at times, but it also gives the TSM some flexibility by being displaced from the "flagpole". Proximity implies immediate and continuous visibility and access. More than occasionally, this immediate access is abused and precludes getting on with the job. The TSM will also be at the point where he can best accomplish the integration of combat and training developments.

Resources

Not unique to any new program is the question of identified resources; personnel, time and money. Enthusiasm for TSM and recognition of just how difficult it is to get additional resources, particularly out of phase with budget cycles, TRADOC has identified eighty five percent of FY-77 and sixty one percent of FY-78 requirements from in house. The nature of these resources, primarily personnel, will be discussed below.

Timing

Review of the TSM offices (Table 1) shows systems in various phases of development, to include one (ASH) which may not be revived. In each case, the TSM will have to play "batch-up". In many cases he will have to play "patch-up" because of problems surfaced prior to his arrival. Reorienting the user community to a new player who will also be the head coach and general manager should be interesting. From the project manager point of view, this should be helpful in that he will have a clearly defined point of entry into the user side of the house.

Personnel

Selection. Criteria for TSM nominees were carefully defined and have considered the nature of each system. Since there has been no historical source of such individuals, a desired background involving such experience as service with the Deputy Chief of Staff for Research, Development and

Acquisition (DCSRDA), experience in requirements with the Deputy Chief of Staff for Operations (DCSOPS), project management office assignments, Defense Systems Management College graduates, and Combat Development Command experience were cited. Other positions in which management expertise or familiarity with the materiel acquisition process has been demonstrated were also identified. After MILPERCEN screening for availability, nominees were viewed by DCSCD, TRADOC and the Commandant of the proponent school/center before submission to Commander, TRADOC for approval. This process will be the norm and is similar to the Colonel/O-6 assignment procedures currently existing. The major difference in the TSM selection process is the visible veto by the reviewers or the Commander, TRADOC.

Training. To assist in preparing those selected for TSM positions, TRADOC is preparing a brief training course at Fort Lee. This course will equip the initial staffs with management tools, and be presented as necessary to meet requirements. However, some more permanent means of providing qualified input on a regular basis to the TSM "loop" is necessary. Possibilities include:

- Attendance at Defense Systems Management College.
- Refining and institutionalizing the course at Fort Lee to include the user perspective in addition to the materiel development flavor of DSMC.

. Personnel management mechanisms for recurring use of systems acquisition expertise between DARCOM and TRADOC.

A formal development program designed to groom officers with managerial and materiel acquisition expertise for productive assignments could be a long range goal. In the interim, satelliting on existing institutionalized training grounds is an adequate solution. In any case, some means of supplying qualified TSM and staffs is necessary as long as the Army persists in approximately thirty percent personnel turnover due to assignment policies. Until such time as the Army moves toward the Air Force policy of keeping qualified people within Systems and Logistics Commands, or rotating them between the two, at most, the requirement for one third turnover each year within the Army will persist, not withstanding the Officer Personnel Management System (OPMS).

Help or Hinderance

Introduction of the TRADOC System Manager can be viewed from two perspectives:

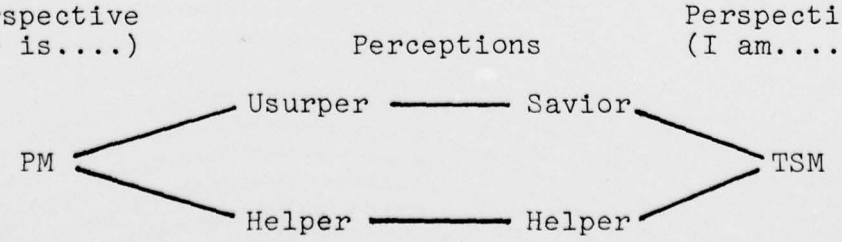

Figure 1

The perception scheme depicted above is not exhaustive. It is a simplistic model to show extremes and suits the purpose of this article, i.e., "forewarned is forearmed". The perspectives are defined as views of the TSM by the PM and by the TSM himself. Focus is on the TSM since he is the new term in the system acquisition equation.

The worst case is the top line where the PM views the TSM as a usurper, a challenge to his authority or capability, and the TSM self perception of being a savior who will bail out and straighten out this incompetent. Little or no progress can be made in that type of adversarial relationship. Since each participant has access to higher echelons (escalate to his charter authority), the usurper-savior relationship will cause nothing but grief, additional wheel spinning, and zero to negative progress in getting the job done. Hinderance is not an ingredient we need to include in the recipe for fielding total systems.

The other extreme depicts both team members perceiving the TSM as a helper. This is the purpose for which the TSM concept is intended. It is this relationship which must exist to make the concept a viable one.

Summary

The TRADOC System Manager concept has merit and deserves support. It is a fact of life formalized by regulation. The future will reflect benefits accrued through proper utilization

of his chartered authority. Accrued benefits can be diminished however, by incorrect perceptions of the TSM and his role by either the materiel developer or the user representative.

GLOSSARY

AAH	Advanced Attack Helicopter
ABN INTEL/EW	Airborne Intelligence and Electronic Warfare Systems
AN/TTC-39	Digital Switchboard
ARGADS	Army Gun Air Defense System
ASH	Advanced Scout Helicopter
ATSS	Automatic Test Support Systems
COPPERHEAD	Canon launched guided projectile
EM INTEL/EW	Electromagnetic Intelligence and Electronic Warfare Systems
FIREFINDER	AN/TPQ-36 and AN/TPQ-37 artillery and mortar locating radars
GSRS	General Support Rocket Systems
HELLFIRE	Heliborne fire and forget missile
ITV	Improved TOW Vehicle
MICV/TBAT	Mechanized Infantry Combat Vehicle/ TOW Bushmaster Armored Turret
PATRIOT	Surface to air missile developments
ROLAND	Missile air defense system
SINCGARS	Single Channel Ground/Airborne Radio Systems
SMOKE	All smoke generating systems
SOTAS	Stand Off Target Acquisition System
STINGER	Shoulder fired air defense weapon
TACFIRE	Automated artillery fire direction
TACSATCOM	Tactical Satellite Communications

TOS	Tactical Operations System
UTTAS	Utility Tactical Transport Aircraft System
XM-1	New main Battle Tank
XM198	Lightweight 155mm Howitzer

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